This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1.   (Previously Presented) A method, comprising:

receiving an I/O request to write an update to an object in storage;

defragmenting the object in storage so that blocks in storage including the object are contiguous in response to receiving the I/O request to write the update to the object, wherein the request to write the update to the object causes the defragmentation operation; and

executing the I/O request to write the update to the object in storage.

2.   (Original) The method of claim 1, wherein the I/O request is executed with respect to the object after defragmenting the object.

3.   (Previously Presented) The method of claim 1, further comprising:

determining whether an amount of fragmentation of the object in the storage exceeds a fragmentation threshold indicating an acceptable number of bytes stored in non-contiguous locations in response to receiving the I/O request, wherein the object is defragmented if the amount of fragmentation exceeds the fragmentation threshold, and wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the amount of fragmentation does not exceed the fragmentation threshold.

4.   (Original) The method of claim 1, further comprising:

determining whether a user settable flag indicates to perform defragmentation in response to receiving the I/O request, wherein the object is defragmented if the flag indicates to perform defragmentation.

5.   (Original) The method of claim 4, further comprising:

executing the I/O request without performing defragmentation if the flag does not indicate to perform defragmentation.

6.   (Previously Presented) The method of claim 1, further comprising:

determining at least one logical partition including the object, wherein the object is defragmented if the object is within one logical partition, wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the object is included in more than one logical partition.

7.   (Previously Presented) The method of claim 1, further comprising:

determining whether the object is read-only, wherein the object is defragmented if the object is not read-only, wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the object is read-only.

8.   (Previously Presented) The method of claim 1, wherein the operations of receiving the I/O request, initiating the operation to defragment the object, and executing the I/O request of defragmenting the object in storage are performed by a storage controller managing I/O requests to the storage.

9.   (Original) The method of claim 1, wherein the operation of defragmenting the object in storage is performed by a device driver for the storage providing an interface to the storage.

10.   (Previously Presented) A system in communication with storage, comprising:
         circuitry enabled to:
                  receive an I/O request to write an update to an object in the storage;
                  defragment the object in storage so that blocks in storage including the object are contiguous in response to receiving the I/O request to write the update to the object, wherein the request to write the update to the object causes the defragmentation operation; and
                  execute the I/O request to write the update to the object in storage.

11.   (Original) The system of claim 10, wherein the I/O request is executed with respect to the object after defragmenting the object.

12.   (Previously Presented) The system of claim 10, wherein the circuitry is further enabled to:

determine whether an amount of fragmentation of the object in the storage exceeds a fragmentation threshold indicating an acceptable number of bytes stored in non-contiguous locations in response to receiving the I/O request, wherein the object is defragmented if the amount of fragmentation exceeds the fragmentation threshold, and wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the amount of fragmentation does not exceed the fragmentation threshold.

13.   (Original) The system of claim 10, wherein the circuitry is further enabled to:

determine whether a user settable flag indicates to perform defragmentation in response to receiving the I/O request, wherein the object is defragmented if the flag indicates to perform defragmentation.

14.   (Original) The system of claim 13, wherein the circuitry is further enabled to:

execute the I/O request without performing defragmentation if the flag does not indicate to perform defragmentation.

15.   (Previously Presented) The system of claim 10, wherein the circuitry is further enabled to:

determine at least one logical partition including the object, wherein the object is defragmented if the object is within one logical partition, wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the object is included in more than one logical partition.

16.   (Previously Presented) The system of claim 10, wherein the circuitry is further enabled to:

determine whether the object is read-only, wherein the object is defragmented if the object is not read-only, wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the object is read-only.

17.   (Previously Presented) The system of claim 10, wherein the circuitry is implemented in a storage controller managing I/O requests to the storage, wherein the operations of receiving the I/O request, initiating the operation to defragment the object, and executing the I/O request of defragmenting the object in storage are performed by the storage controller.

18.   (Original) The system of claim 10, wherein the circuitry is implemented in a device driver interfacing between an operating system and the storage, and wherein the operation of defragmenting the object in storage is performed by the device driver.

19.   (Currently Amended) A system, comprising:

storage;

a storage controller coupled to the storage, wherein the storage controller is enabled to:

receive an I/O request to write an update to an object in the storage;

defragment the object in storage so that blocks in storage including the object are contiguous in response to receiving the I/O request to write the update to the object, wherein the request to write the update to the object causes the defragmentation operation; and

[[(iii)]] execute the I/O request to write the update the object in storage.

20.   (Previously Presented) The system of claim 19, wherein the storage controller is further enabled to:

determine whether an amount of fragmentation of the object in the storage exceeds a fragmentation threshold indicating an acceptable number of bytes stored in non-contiguous locations in response to receiving the I/O request, wherein the object is defragmented if the amount of fragmentation exceeds the fragmentation threshold, and wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the amount of fragmentation does not exceed the fragmentation threshold.

21.   (Original) The system of claim 19, wherein the storage controller and storage device are included in a same housing.

22.   (Original) The system of claim 19, further comprising:

a processor; and

a memory enabled to store the I/O request before the I/O request is received by the

storage controller.

23.   (Currently Amended) An article of manufacture comprising at least one of a

computer readable storage medium having code executed by a processor and a hardware device

having logic to communicate in communication with a storage and perform operations, the

operations comprising, wherein the article of manufacture is enabled to:

receive an I/O request to write an update to an object in storage;

defragment the object in storage so that blocks in storage including the object are

contiguous in response to receiving the I/O request to write the update to the object, wherein the

request to write the update to the object causes the defragmentation operation; and

execute the I/O request to write the update to the object in storage.

24.   (Original) The article of manufacture of claim 23, wherein the I/O request is

executed with respect to the object after defragmenting the object.

25.   (Previously Presented) The article of manufacture of claim 23 further enabled to:

determine whether an amount of fragmentation of the object in the storage exceeds a

fragmentation threshold indicating an acceptable number of bytes stored in non-contiguous

locations in response to receiving the I/O request, wherein the object is defragmented if the

amount of fragmentation exceeds the fragmentation threshold, and wherein the I/O request to

update the object is executed without defragmenting the object in response to determining that

the amount of fragmentation does not exceed the fragmentation threshold.

26.   (Original) The article of manufacture of claim 23 further enabled to:

determine whether a user settable flag indicates to perform defragmentation in response

to receiving the I/O request, wherein the object is defragmented if the flag indicates to perform

defragmentation.

27.   (Previously Presented) The article of manufacture of claim 26 further enabled to:

execute the I/O request without performing defragmentation if the flag does not indicate

to perform defragmentation.

28.   (Previously Presented) The article of manufacture of claim 23 further enabled to:

determine at least one logical partition including the object, wherein the object is

defragmented if the object is within one logical partition, wherein the I/O request to update the

object is executed without defragmenting the object in response to determining that the object is

included in more than one logical partition.

29.   (Previously Presented) The article of manufacture of claim 23 further enabled to:

determine whether the object is read-only, wherein the object is defragmented if the

object is not read-only, wherein the I/O request to update the object is executed without

defragmenting the object in response to determining that the object is read-only.

30.   (Original) The article of manufacture of claim 23 wherein the operation of

defragmenting the object in storage is performed by a storage controller managing I/O requests

to the storage.

31.   (Previously Presented) The article of manufacture of claim 23, wherein the

operations of receiving the I/O request, initiating the operation to defragment the object, and

executing the I/O request of defragmenting the object in storage are performed by a device

driver for the storage providing an interface to the storage.

32.   (New) The method of claim 1, further comprising:

determining whether an amount of fragmentation of the object in the storage exceeds a

fragmentation threshold indicating an acceptable number of bytes stored in non-contiguous

locations in response to receiving the I/O request;

determining at least one logical partition including the object, wherein the object is

defragmented if the object is within one logical partition; and

determining whether the object is read-only, wherein the object is defragmented if the object is not read-only, wherein the I/O request to update the object is executed without defragmenting the object in response to determining at least one of that the object is included in more than one logical partition, that the object is read-only, and that the amount of fragmentation does not exceed the fragmentation threshold.

33.   (New) The system of claim 10, wherein the circuitry is further enabled to:

determine whether an amount of fragmentation of the object in the storage exceeds a fragmentation threshold indicating an acceptable number of bytes stored in non-contiguous locations in response to receiving the I/O request;

determine at least one logical partition including the object, wherein the object is defragmented if the object is within one logical partition; and

determine whether the object is read-only, wherein the object is defragmented if the object is not read-only, wherein the I/O request to update the object is executed without defragmenting the object in response to determining at least one of that the object is included in more than one logical partition, that the object is read-only, and that the amount of fragmentation does not exceed the fragmentation threshold.

34.   (New) The article of manufacture of claim 23, further comprising:

determining whether an amount of fragmentation of the object in the storage exceeds a fragmentation threshold indicating an acceptable number of bytes stored in non-contiguous locations in response to receiving the I/O request;

determining at least one logical partition including the object, wherein the object is defragmented if the object is within one logical partition; and

determining whether the object is read-only, wherein the object is defragmented if the object is not read-only, wherein the I/O request to update the object is executed without defragmenting the object in response to determining at least one of that the object is included in more than one logical partition, that the object is read-only, and that the amount of fragmentation does not exceed the fragmentation threshold.